

CLAIMS

1. A particle optical apparatus comprising a particle source for producing a primary beam of electrically charged particles; a monochromator filter assembly located after the particle source and an aperture plate containing at least one aperture for shaping the particle beam, located between the particle source and the monochromator filter assembly; characterized in that the aperture plate is adjustable with respect to the monochromator filter assembly during normal operation of the apparatus so that the size of the aperture for shaping the particle beam can be varied.

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2. A particle optical apparatus according to Claim 1 wherein the aperture plate contains two or more apertures of different sizes.

3. A particle optical apparatus according to Claim 2 wherein the aperture plate has more than one said aperture and is displaceable relative to the monochromator filter to selectively align a said aperture with the beam.

4. A particle optical apparatus according to Claim 1 wherein the aperture plate is formed from two or more partial plates.

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5. A particle optical apparatus according to Claim 4 wherein the partial plates co-operate to provide an aperture of variable size.

6. A particle optical apparatus according to Claim 5 wherein the partial plates can move towards or away from the centre of the aperture to vary the size of the aperture.

5 7. A particle optical apparatus according to any of Claims 1 to 6 wherein the aperture plate is adjustable using mechanical control means.

8. A particle optical apparatus according to Claim 7 wherein the mechanical control means incorporates a section made from electrically 10 insulating material.

9. A particle optical apparatus according to Claim 8 wherein the electrically insulating material is Aluminium Oxide (Al_2O_3).

15 10. A particle optical apparatus according to any of Claims 1 to 6 wherein the aperture plate is adjustable using electronic control means.

11. A particle optical apparatus according to Claim 10 wherein the electronic control means is a piezoelectric control means.

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12. A particle optical apparatus according to any of the Claims 1 to 6 wherein the aperture plate is adjustable using means responsive to incident optical radiation.

13. A particle optical apparatus according to Claim 12 wherein said means responsive to incident optical radiation is a bimetallic component.
14. A particle optical apparatus according to Claim 12 wherein said means responsive to incident optical radiation is an electronic control means.
15. A particle optical apparatus according to any of Claims 1 to 14 including a particle gun comprising said particle source and a gun lens located after said particle source for focussing the beam, the aperture plate being located between the gun lens and the monochromator filter assembly.
16. A particle optical apparatus according to any of Claims 1 to 14 including a particle gun comprising said particle source and a gun lens located after said particle source for focussing the beam, the aperture plate being located between the particle source and the gun lens.
17. A particle optical apparatus according to any preceding claim wherein the monochromator filter assembly is a Wien filter.
- 20 18. A particle optical apparatus substantially as herein described with reference to the accompanying figures.